

Amendments to the Claims

The following listing of claims replaces all prior versions and listings of claims in this application:

1. (Currently Amended) Solid porous cellular hydrocolloid carriers comprising ~~porous freeze-dried hydrocolloid beads having a porosity of about 87 +/- SD 1.5% to about 94 +/- SD 0.1% and comprising~~ that include viable microorganisms entrapped therein, wherein the hydrocolloid is an alginate, agarose, Low Methoxy Pectin (LMP), polyvinyl alcohol (PVA), Carrageenan or xanthan plus locust bean gum (LBG); and wherein the freeze-dried beads have diameters ranging from 50 microns to 500 microns; have a residual moisture of no more than 12%[[20%]], and include a cryoprotectant comprising glycerol in an amount of 10 to 50 % by weight of the hydrocolloid, sufficient for maintaining viability of wherein a not less than 50% to 95% of the microorganisms are viable both during freeze drying and after 12 to 36 months of storage as a dried solid at temperatures at or below minus 18°C.

Claims 2-6. (Cancelled)

7. (Original) The solid cellular carriers according to claim 1, wherein exposure to moisture induces growth of the entrapped microorganism within the hydrocolloid beads.

8. (Original) The solid cellular carriers according to claim 1, wherein exposure to moisture induces extended release into the environment of either the entrapped microorganisms or active products produced by the microorganisms.

Claim 9. (Cancelled)

10. (Currently Amended) The solid cellular carriers of claim 1[[9]], wherein the hydrocolloid is alginate.

11. (Currently Amended) The solid cellular carriers of claim 1[[9]], wherein the hydrocolloid carriers are biodegradable.

12. (Original) The solid cellular carriers of claim 1, wherein the microorganisms are bacteria or fungi capable of controlling plant pathogens.

13. (Original) The solid cellular carriers of claim 12, wherein the microorganisms are fungi selected from the group consisting of *Trichoderma harzianum*, *Trichoderma lignorum* and *Trichoderma viride*.

14. (Original) The solid cellular carriers of claim 12, wherein the microorganisms are bacteria capable of controlling plant pathogens.

15. (Original) The solid cellular carriers of claim 14, wherein the bacteria are selected from the group consisting of *Pantoea agglomerans*, *Serratia marcescens*, *Bacillus Spp.*, *Enterobacter Spp.*, *Azotobacter*, *Azospirillum* and *Pseudomonas*.

16. (Original) The solid cellular carriers of claim 8, wherein the active products produced by the microorganisms are enzymes or antibiotics selected from the group consisting of chitinase, gluconases, proteases, pyrrolnitrin, pyrrolnitorin, phenazines, DAPG (2,4,diacetylfluoroglucinol), ferrichrome A and desferrioxamine B.

Claim 17. (Cancelled)

18. (Original) The solid cellular carriers of claim 1, further comprising one or more of nutrients, fillers, agents for controlling the porosity of the carriers, agents that prevent damage to the viable microorganisms during freezing, or agents that control cell wall thickness.

19. (Original) The solid cellular carriers of claim 18, wherein the nutrients or fillers are selected from the group consisting of chitin, pectin, cellulose, lignin, bentonite, kaolin, starch, glycerol and lowfat milk.

20. (Original) The solid cellular carriers of claim 14, wherein the plant pathogens are selected from the group consisting of *Pythium aphanidermatum*, *S. scabies*, *Verticillium dahliae*, *Verticillium albo-atrum*, *Fusarium solani*, *Rhizoctonia solani*, *Cylindrocladium floridanum*, *Clavibacter michiganense* subsp. *sepidonicum*, *Phytophthora megasperma* pv. *glycinea* race 1, *Pythium* spp., *Septoria* spp. and *Sclerotinia*.

Claim 21. (Cancelled)

22. (Withdrawn) A method for controlling plant pathogens in an agricultural crop which comprises: applying solid cellular carriers comprising dried hydrocolloid beads according to claim 1 and having viable microorganisms entrapped therein to an entity selected from seeds, seedlings or plants of an agricultural crop wherein the microorganisms or active products produced by the microorganisms are eventually released from the beads to effectively control plant pathogens.

23. (Currently Amended, Withdrawn) The method of claim 22, ~~wherein the hydrocolloid is an alginate, agarose, Low Methoxy Pectin (LMP), polyvinyl alcohol (PVA), Carrageenan and xanthan plus locust bean gum (LBG), and~~ which further comprises contacting the beads to moisture to induce extended release into the surrounding environment of either the entrapped microorganisms or active products produced by the microorganisms.

24. (Withdrawn) The method of claim 23, wherein said hydrocolloid is alginate.

Claim 25. (Cancelled)

26. (Withdrawn) The method of claim 22, wherein the microorganisms are bacteria or fungi capable of controlling plant pathogens.

27. (Withdrawn) The method of claim 26, wherein said fungi are selected from the group consisting of *Trichoderma harzianum*, *Trichoderma lignorum* and *Trichoderma viride*.

28. (Withdrawn) The method of claim 26, wherein said bacteria are selected from the group consisting of *Pantoea agglomerans*, *Serratia marcescens*, *Bacillus Spp.*, *Enterobacter Spp.*, *Azotobacter*, *Azospirillum* and *Pseudomonas*.

29. (Withdrawn) The method of claim 22, wherein the active products produced by the microorganisms are enzymes or antibiotics selected from the group consisting of chitinase, gluconases, proteases, pyrolnitrin, pyrolniteorin, phenazines, DAPG (2,4,diacetylfluoroglucinol), ferrichrome A and desferrioxamine B.

Claim 30. (Cancelled)

31. (Withdrawn) A method of producing the cellular solid carriers according to claim 1 comprising:

- mixing a hydrocolloid solution with viable microorganisms;
- adding a cryoprotectant to the hydrocolloid solution and microorganisms to form a mixture; and
- drying the mixture under conditions which preserve the porosity of the mixture, thereby forming dried cellular solid hydrocolloid beads comprising viable microorganisms entrapped in the porosity of the beads.

Claims 32-33. (Cancelled)

34. (Withdrawn) The method of claim 31, which further comprises adding to the mixture one of more of nutrients, fillers, agents for controlling the porosity of the beads, agents that prevent damage to the viable microorganisms during freezing, or agents that control cell wall thickness.

35. (Withdrawn) The method of claim 34, wherein the nutrients or fillers are selected from the group consisting of chitin, pectin, cellulose, lignin, bentonite, kaolin, starch, and lowfat milk.

36. (Withdrawn) A method of increasing the viability of biological control microorganisms in field conditions which comprises entrapping the biological control microorganisms as the viable microorganisms within the solid cellular carriers according to claim 1 prior to the application of the microorganisms to the agricultural field, thereby increasing the viability of biological control microorganisms in field conditions.

Claims 37-38. (Cancelled)

39. (Withdrawn) The method of claim 36, wherein the biological control microorganisms are bacteria or fungi.

40. (Withdrawn) The method of claim 36, wherein the solid cellular carriers comprising hydrocolloid beads protect the biological control microorganisms against UV radiation.

Claims 41-42. (Cancelled)

43. (Currently Amended) The solid cellular carriers of claim 1, wherein the carriers have a bead wall porosity ~~includes pores separated by bead walls having an average thickness of~~ about 1.55 micrometers to about 11.43 micrometers.

Claim 44. (Cancelled)

45. (New) Solid porous cellular hydrocolloid carriers consisting essentially of porous freeze-dried hydrocolloid beads that include viable microorganisms entrapped therein, wherein the hydrocolloid is an alginate, agarose, Low Methoxy Pectin (LMP), polyvinyl alcohol (PVA), Carrageenan or xanthan plus locust bean gum (LBG); and wherein the freeze-dried beads have diameters ranging from 50 microns to 500 microns; have a residual moisture of no more than 12%, include a cryoprotectant comprising glycerol in an amount of 10 to 50 % by weight of the hydrocolloid, and include one or more of nutrients or fillers selected from the group consisting of chitin, pectin, cellulose, lignin, bentonite, kaolin, starch, glycerol and lowfat milk in an amount

sufficient to control the porosity of the beads, wherein not less than 50% to 95% of the microorganisms are viable both during freeze drying and after 12 to 36 months of storage as a dried solid at temperatures at or below minus 18°C.

46. (New, Withdrawn) A method for controlling plant pathogens in an agricultural crop which comprises: applying solid cellular carriers comprising dried hydrocolloid beads according to claim 45 and having viable microorganisms entrapped therein to an entity selected from seeds, seedlings or plants of an agricultural crop wherein the microorganisms or active products produced by the microorganisms are eventually released from the beads to effectively control plant pathogens.

47. (New, Withdrawn) A method of producing the cellular solid carriers according to claim 45 comprising:

- mixing a hydrocolloid solution with viable microorganisms;
- adding a cryoprotectant to the hydrocolloid solution and microorganisms to form a mixture; and
- drying the mixture under conditions which preserve the porosity of the mixture, thereby forming dried cellular solid hydrocolloid beads comprising viable microorganisms entrapped in the porosity of the beads.

48. (New, Withdrawn) A method of increasing the viability of biological control microorganisms in field conditions which comprises entrapping the biological control microorganisms as the viable microorganisms within the solid cellular carriers according to claim 45 prior to the application of the microorganisms to the agricultural field, thereby increasing the viability of biological control microorganisms in field conditions.